

Advanced Materials

HYPOX® RA 16213

Reactive Toughener and flexibilizer

DATA SHEET

CTB and CTBN-Toughened BADGE Adduct

Properties

HYPOX® RA16213 is an adduct of a liquid diglycidyl ether of bisphenol A (DGEBA) and CTB (carboxyl terminated butadiene) and CTBN (carboxyl terminated butadiene-acrylonitrile). It is unique by its presence of the low-Tg CTB reactive liquid polymer. CTB is typically insoluble in bis-A epoxy resins. The patented process to produce making HYPOX® RA16213 results in a miscible epoxy-CTB-CTBN adduct. The combination of elastomers gives superior low-temperature and room-temperature toughening performance in dicyandiamide-cured epoxy adhesives compared to other CTBN-toughened adducts while maintaining solubility in the uncured epoxy resin. Enhanced toughening characteristic, particularly at low temperatures, is attributed to the inclusion of CTB. The elastomers also improve the impact, thermal shock and peel resistance of the DGEBA resin, with exceptional performance at low temperatures.

Applications

HYPOX® RA16213 is suggested for use as a toughener in structural one-component epoxy adhesives, prepregs and composite applications. It can be blended with other epoxy resins to balance properties, which is a common practice among epoxy formulators.

- Adhesives
- Prepregs/composites
- Coatings

Key data

Specified key data

Epoxy Equivalent Weight (ASTM D1652-90)	245 – 285	[g/eq]
Viscosity at 27 °C (Brookfield ASTM D2196-05)	100 000 – 150 000	[mPa s]
Acid Value (ASTM D8045)	<0.1	

Specified key data are individually checked throughout and guaranteed.

Typical key data

Flash point (Pensky Martens, DIN 51758)	≥ 200	[°C]
Appearance	Opaque, Amber Viscous Liquid	
CTBN content	29%	

Data which is described in this document as 'typical' is not analyzed on a regular basis and is given for information purposes only. Data values are not guaranteed or warranted unless if specifically mentioned.

In addition to the brand name product denomination may show different appendices, which allows us to differentiate between our production sites: e.g. BD = Germany, US = United States, IN = India, CI = China, etc. These appendices are in use on packaging, transport and invoicing documents. Generally, the same specifications apply for all versions. Please address any additional need for clarification to the appropriate Huntsman contact.

Storage	<p>HYPOX® RA 16213 should be stored in a dry place, preferably in the sealed original container, at temperatures between 2 and 40 °C. The product should not be stored exposed to direct sunlight.</p> <p>Keep away from food, drink and animal feeding stuff.</p>
Handling precautions	<p>HYPOX® RA16213 is not a primary skin irritant or sensitizer. However, as with any epoxy material, irritation can result from repeated or prolonged contact. The symptoms of this irritation may appear as a mild reddening or a more pronounced rash. It is, therefore, important to avoid skin contact where possible. Butyl rubber gloves, full eye protection and protective clothing are recommended.</p> <p>Skin contact: Wash well with soap and water. Remove contaminated clothing and wash thoroughly before reusing. It is recommended that resin not be removed from skin with solvents since solvents increase contact and encourage penetration. Moreover, solvents of themselves dry and crack the skin.</p> <p>Eye contact: Flush immediately with large quantities of water. Contact a physician.</p> <p>Refer to the Safety Data Sheet on HYPOX® RA16213 for additional safety and health information. The SDS is revised as new data becomes available.</p>

Huntsman Advanced Materials
(Switzerland) GmbH
Klybeckstrasse 200
4057 Basel
Switzerland

Tel: +41 (0)61 299 11 11
Fax: +41 (0)61 299 11 22

www.huntsman.com/advanced_materials
Email: advanced_materials@huntsman.com



Huntsman Advanced Materials warrants only that its products meet the specifications agreed with the user. Specified data are analysed on a regular basis. Data which is described in this document as 'typical' or 'guideline' is not analysed on a regular basis and is given for information purposes only. Data values are not guaranteed or warranted unless if specifically mentioned.

The manufacture of materials is the subject of granted patents and patent applications; freedom to operate patented processes is not implied by this publication. While all the information and recommendations in this publication are, to the best of Huntsman Advanced Material's knowledge, information and belief, accurate at the date of publication, nothing herein is to be construed as a warranty, whether express or implied, including but without limitation, as to merchantability or fitness for a particular purpose. In all cases, it is the responsibility of the user to determine the applicability of such information and recommendations and the suitability of any product for its own particular purpose.

The behaviour of the products referred to in this publication in manufacturing processes and their suitability in any given end-use environment are dependent upon various conditions such as chemical compatibility, temperature, and other variables, which are not known to Huntsman Advanced Materials. It is the responsibility of the user to evaluate the manufacturing circumstances and the final product under actual end-use requirements and to adequately advise and warn purchasers and users thereof.

Products may be toxic and require special precautions in handling. The user should obtain Safety Data Sheets from Huntsman Advanced Materials containing detailed information on toxicity, together with proper shipping, handling and storage procedures, and should comply with all applicable safety and environmental standards.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent on manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

Except where explicitly agreed otherwise, the sale of products referred to in this publication is subject to the general terms and conditions of sale of Huntsman Advanced Materials LLC or of its affiliated companies including without limitation, Huntsman Advanced Materials (Europe) BVBA, Huntsman Advanced Materials Americas Inc., Huntsman Advanced Materials (UAE) FZE, Huntsman Advanced Materials (Guangdong) Company Limited, and Huntsman Advanced Materials (Hong Kong) Ltd.

Huntsman Advanced Materials is an international business unit of Huntsman Corporation. Huntsman Advanced Materials trades through Huntsman affiliated companies in different countries including but not limited to Huntsman Advanced Materials LLC in the USA and Huntsman Advanced Materials (Europe) BVBA in Europe.

All trademarks mentioned are either property of or licensed to Huntsman Corporation or an affiliate thereof in one or more, but not all, countries.

Copyright © 2020 Huntsman Corporation or an affiliate thereof. All rights reserved.